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Shipping Radioactive Waste by Rail from Brookhaven National Laboratory



**National Transportation Stakeholders Forum
May 14, 2014**

Terri Kneitel, PE, PMP
U.S. Department of Energy

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Discussion Topics

- Why Rail?
- How is waste shipped?
- What do we ship by rail?
- DOT Requirements
- Where does the waste go?
- Logistics
- BNL Rail Shipment Overview
- Extensive Outreach - BNL Transportation Working Group
- BNL Rail Shipment & Notification Protocols

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Why Rail?

<h3>Rail</h3> <ul style="list-style-type: none">• 1 car hauls 197,000 pounds<ul style="list-style-type: none">— Gross Wt. 263,000 pounds• Approximately \$18,000 per railcar	<h3>Truck</h3> <ul style="list-style-type: none">• 1 truck hauls 43,000 pounds<ul style="list-style-type: none">— Gross Wt. 80,000 pounds• Approximately \$10,000 per truck
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How is waste shipped?

<p>Gondola railcars lined with a “Super Load Wrapper” (IP-1 Package)</p> <div></div>	<p>ABC Flat Cars that hold up to 8 intermodal containers</p> <div></div>
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Installing a Railcar Liner



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Loading a Railcar



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Covering the Railcar



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Super Sacks



- Sometimes waste is loaded into Super Sacks (IP-1 Packages)
- Then the sacks are loaded into a railcar with a crane.

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What do we ship by rail?

- Waste shipments from BNL are predominantly lightly contaminated soil and demolition debris resulting from environmental cleanup projects or activated metals and concrete from the accelerators.
- Contamination levels are usually quite low.
 - The dominant radioisotope in the waste is Cesium-137.
 - Contamination concentrations vary, but typically average 300 to 500 pico-Curies per gram.
 - Typical total activity of the waste in railcars is in the 40 to 80 milli-Curie range; this is a relatively small quantity of radioactive material .
- Often the material in the rail cars is below the DOT limits and not considered, by DOT, to be radioactive material.

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DOT Requirements

- Some waste is transported as Class 7 per 49CFR173.401
 - Low Specific Activity (LSA) is the “lowest category” of Class 7 waste.
 - BNL shipments are typically 3% to 5% of the LSA limits.
 - Radiation levels on railcar surface is only a few milli-Rem per hour and near background 25 to 30 feet from the cars.



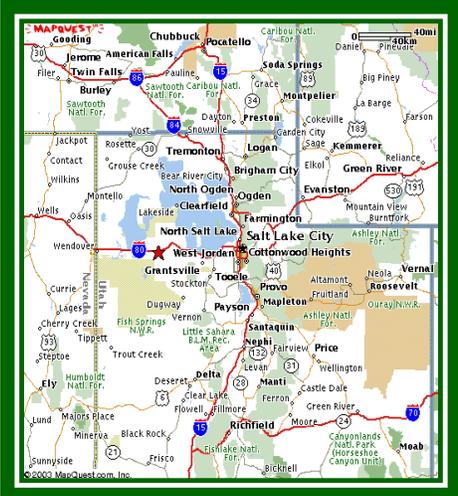
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Where Does the Waste Go?

Envirocare of Utah







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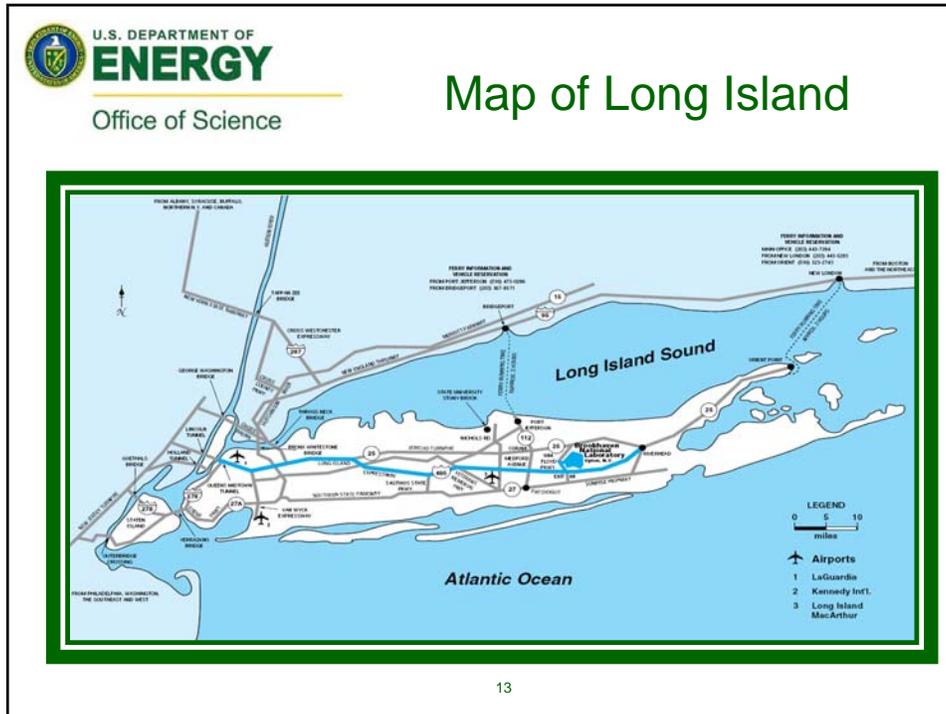


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Logistics

- Long Island Railroad (LIRR) owns the tracks but is strictly a commuter rail system, servicing over 300,000 passengers daily.
- New York and Atlantic Railway (NY&A) moves the freight on track owned by LIRR.
- Most of the distance from BNL to New York City is single track with limited spurs for most of its length.

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Logistics

- In the beginning shipments took more than a week just to get off Long Island and out of the NYC Metropolitan area.
 - 1st stop Deer Park – average hold time 1 day
 - 2nd stop Fresh Pond (Queens) – average hold time 5 days
 - 3rd stop Oak Point (Bronx) – average hold time 2 days
 - 4th stop Selkirk (Albany) – average hold time 3 days
- Travel time to reach Clive, Utah – average 21 days
- NY&A preferred to pick up and drop off rail cars after 11 pm and on weekends – to avoid conflicts with commuter trains.
- Hell Gate Bridge – only land connection to Long Island for rail freight - 196k weight limit below industry standard 286k.

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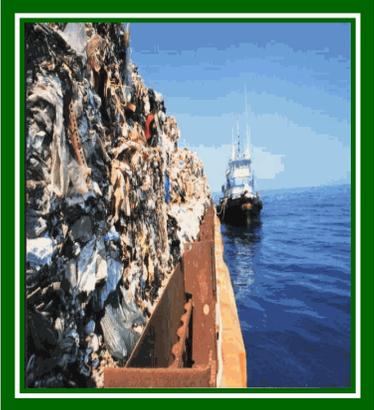


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BNL Rail Shipment Overview

- Prior to 2004, BNL only shipped wastes that were non-radioactive per DOT (un-placarded shipments) by rail.
- Could not ship radioactive waste by rail due to an agreement between NY&A railroad, LIRR and the Borough of Queens.
 - The railroads agreed that they would not make any Waste or Radioactive shipments thru Queens.
 - Remember the garbage barge?
 - In exchange for not shipping wastes, railroads got use of the Fresh Pond Junction rail yard in Queens.



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BNL Rail Shipment Overview

- The NYC Law Department declared this agreement “unenforceable” in October 2003.
- BNL made our first Class 7 rail shipment in May 2004.
- The following June the Borough of Queens halted all rail shipments from BNL from passing thru Queens.
 - News coverage followed:

“NEW YORK, N.Y., July 26 (UPI) -- Radioactive soil shipments from Brookhaven National Laboratory might soon resume under an agreement between New York City and the Long Island Rail Road. The railroad halted the shipments -- part of a years-long cleanup effort at the lab -- on June 23, citing an agreement requiring New York City's Queens borough president's permission before shipping hazardous waste, Newsday reported Tuesday.”

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Extensive Outreach

- The **BNL Transportation Working Group** was Formed
- Purpose:
 - To provide ongoing coordination with our regional partners for all radiological shipments from BNL.
 - To ensure open communication with regional emergency managers, law enforcement and transportation officials.
 - To coordinate scheduling, planning, security, messaging and outreach.
- Agreed to notification & shipment protocols, shipment schedules, operational considerations, inspections.

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BNL Transportation Working Group

Working Group Participants:

- DOE Brookhaven Site Office
- BNL - Transportation Officer, Waste Management Division and Emergency Director;
- Emergency Management Directors from New York State; Suffolk, Nassau and Westchester Counties, and New York City;

Transportation Partners:

- Long Island Railroad, MTA and Metro North rail lines, NY & Atlantic Railroad
- New York City Department of Transportation

Law Enforcement coordination includes:

- Coordination with New York City, Suffolk and Nassau County Police;
- Counter Terrorism Divisions of New York City and Suffolk County Police Departments.

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BNL Rail Shipment Protocols

- BNL Rail Loading Procedure
 - Use shipment loading checklist - signoffs at each step
 - DOE field oversight and checklist reviews
- LIRR created procedure for BNL shipments
 - LIRR sends Safety Inspector to walk down each train
- BNL makes notifications in accordance with protocols
- Shipments made on weekends only
- Direct pull thru to Queens – no stops on Long Island
 - NY&A had to use 2 engines to make the pull
- Switch trains immediately - new train required to leave Queens same night for Bronx and then be on the next train up to Selkirk

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Notification Protocols

- BNL agreed to voluntarily notify the New York State Office of Emergency Management by email two weeks in advance of rail shipments.
 - And again when the train leaves the site
- NYS notifies Warning Points fax info via Trip-Ticket:
 - New York City OEM
 - Who in turn notifies NYPD, NYFD, NYC Counter-Terrorism Taskforce
 - County OEM's
 - Suffolk, Nassau, Queens, Bronx, Westchester
- MTA tracks train and keeps NYC OEM informed

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Notification Protocols



BROOKHAVEN NATIONAL LABORATORY

BROOKHAVEN NATIONAL LABORATORY
TRANSPORTATION NOTIFICATION PROTOCOLS

The following table proposes Notification Protocols for hazardous material shipments from Brookhaven National Laboratory (BNL). Notifications will be from BNL to the point of contact designated by New York State, Suffolk County, Nassau County, NYC, and Westchester County Office of Emergency Management (OEM) officials.

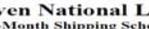
Waste Type	DOT Classification	Transport Type	Six Month Shipping Schedule	One Month Prior to Shipment	Two Weeks Prior to Shipment	Day of Shipment	
Hazardous and/or Industrial Waste	Hazardous Waste	Road					
		Rail	N/A				
	Non-Placarded Industrial Wastes	Road					
		Rail	X				
Radioactive Waste	Non-Placarded	Road					
		Rail	X				
	I.S.A I and II, Placarded 'Radioactive 7'	Road					
		Rail	X	X	X	X	
		Road	X	X	X	X	
		Rail	X	X	X	X	
		Road	X	X	X	X	
		Rail	X	X	X	X	
		Road	X	X	X	X	
		Rail	X	X	X	X	
Special or unusual Shipments	Road	X	X	X	X		
	Rail	X	X	X	X		

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Six Month Shipping Schedules & Fact Sheets



Brookhaven National Laboratory
Six-Month Shipping Schedule
Published May 19, 2010

Please Note: shipping dates and number of trucks and railcars may change based on work progress and availability of equipment

Rail Shipments:

Date	Number of Railcars	Material Type	Destination
May-June	4 ABC Flatcars	concrete, dirt, debris Non-Regulated	Energy Solutions, UT
June-July	20 ABC Flatcars	Concrete, dirt, debris Non-Regulated	Energy Solutions, UT
September	2 ABC Flatcars	Concrete, metal Class 7	Energy Solutions, UT
Oct-April	30 ABC Flatcars	Concrete, metal, debris Non-Regulated	Energy Solutions, UT
Oct-April	30 ABC Flatcars	Concrete, metal, debris Class 7	Energy Solutions, UT

Truck Shipments:

Date	Oversize/Overweight	Number of Trucks	Material Type	Destination
May-June	NO	8 Flatbeds	Activated Metal Class 7	Energy Solutions, UT
May-June	Yes	7 SMAC's	Graphite Waste Class 7	Nevada Test Site
May-June	No	4 Covered Wagon Flatbeds	Graphite Waste Class 7	Nevada Test Site
May	No	2 Covered Wagon Flatbeds	HFBR Lead Waste Class 7	Energy Solutions, UT

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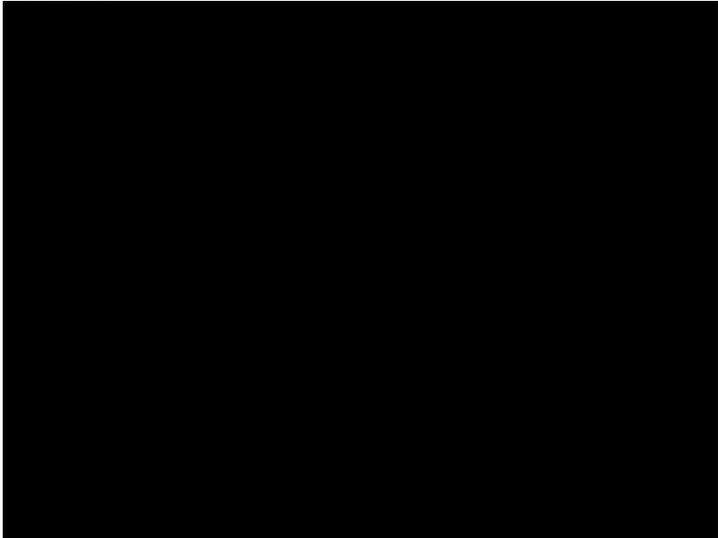
Upcoming Shipments

- We may send 1 to 2 trains of soil and demolition debris this summer/fall.
- Work on planning Outreach to the Transportation Working Group is already underway.
- Briefings will be held (or information will be distributed) approximately 6 weeks before planned shipments.

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Rail Video



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 <p>U.S. DEPARTMENT OF ENERGY Office of Science</p>	<h2>Contact Information</h2>
<p><u>Point of Contact:</u></p>	<p>Terri Kneitel, PE, PMP Environmental Engineer Brookhaven Site Office Phone: (631) 344-2112 FAX: (631) 344-3444 E-Mail: kneitel@bnl.gov</p>
<p><u>Site mailing address:</u></p>	<p>US Department of Energy Brookhaven Site Office 53 Bell Avenue, Building 464 Upton, New York 11973</p>